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first satellite was in mid-transit on that night at $15^h\ 27^m$, and it would be seen projected on the bright surface of the equatorial zone just north of the planet's equator. Consequently, when in mid-transit, the satellite would have been seen as a dark spot just north of the above-mentioned spot, and the two would have appeared as a close double spot. In other words, the appearance would have been almost exactly that represented by Mr. Barnard in fig. 4, Plate 14. Whether this explanation be considered sufficient or not, it appears to me very important that the presence of this little dark spot should be placed on record.

In conclusion, I may mention that the first satellite was visible in dark-transit on July 26, 1890, in nearly the same position relative to the belts as the northernmost of the two spots shown in Mr. Barnard's sketch, but a little nearer to the equator. Since the elevation of the earth above the plane of *Jupiter's* equator was $-0^\circ{\cdot}297$ on July 26, compared with $-0^\circ{\cdot}402$ on September 8, the position of the satellite on the latter date should have agreed very closely with that of the northernmost of the two spots in fig. 4, Plate 14.

Burgess Hill:
1891 *November* 7.

Note on some Photographs of Jupiter taken with the Five-foot Reflecting Telescope. By A. A. Common, LL.D., F.R.S.

A new mirror for the 5-foot telescope was completed in July, and some experiments have been made in photographing *Jupiter* to determine the exposure necessary and the definition obtainable. With the primary image a good picture is obtained with the quickest exposure that can be given by hand. About 2^s gives a dense image and all the visible satellites, with an enlarging lens giving an image of about $\frac{1}{2}''$ 3^s to 6^s gives ample density, up to 1 inch from 8^s to 10^s gives sufficient density. For further enlargement the time is, of course, proportional. About $1\frac{3}{4}$-inch diameter is the largest we have tried, but this was done on an unfavourable night.

following observations of it will show that its motion did not differ greatly from Mr. Marth's System I.:—

Date.	G.M.T. of Transit.	Longitude. System I.
1890.	h m	°
Aug. 1	11 46·5	111·4
3	13 5·8	115·8
Sept. 9	10 55·6	121·1
Oct. 9	9 23·2	119·9
12	6 20·5	121·9

It was also seen on September 5, but the time of its transit was not recorded.

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With regard to the definition, the detail on the planet is not so well given as in the Lick photographs, though closely approaching in the best photographs to this. With an enlargement to a diameter of ·8 of an inch, the satellites are fairly round, and about the proportionate size, though rather faint, the exposure being about 7^s. These photographs were taken with this exposure for the planet, and I did not expect to see any trace of the satellites. Photographs taken on this night, September 8, at short intervals of time, show Sat. II. emerging from the limb, while the shadow is still visible on the disc. When the satellite is well clear, the shadow seems to cut a piece out of the limb.

Another photograph on September 10 shows this with Sat. III. in a similar manner.

Several photographs taken on September 15 show Sat. II. and its shadow in transit. The red spot shows in a most marked manner in many. From an examination of the enlarged image of the planet, and also of the limb of the Moon, it appears to me that definition depends very much on the atmospheric conditions. In looking at the image enlarged on very fine ground glass, there are moments when the image is very sharp and steady. Then the image becomes blurred, and good definition disappears for a few seconds. The nights have been too few to determine whether this is a permanent condition of things, probably there may be nights when the definition is good continuously.

The Reappearance of Saturn's Ring. By the Rev. A. Freeman, M.A.

With the aid of a 6-inch refractor by Simms, lent to me by the Royal Astronomical Society, and having a focal length of 7 feet and a magnifying power of 180, I have fortunately obtained very fine views of *Saturn* in the early mornings of October 29, 30, 31, November 2 and 3. The sky was unhappily overcast on November 1, and from November 4 to 9. The description of what was seen follows:—

October 29, 5^h 55^m A.M. (civil time).—*Saturn's* elliptical disc is crossed by a dark band, its breadth about one-tenth of the length of the polar diameter of the planet. The north edge of this band seems to be on the equator of the planet. The equatorial bright belt, which is yellowish, seemed about half the breadth of the dark band, which is, of course, the unilluminated north side of the rings. I could see no division in this band. The first southern dusky belt is visible, and the rest of *Saturn's* disc is of a pale white colour except at the poles, which are dusky. The crescent moon is only about 4° to the east of *Saturn* and nearly at the same altitude. *Titan* ceased to be visible at 6^h 30^m.

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